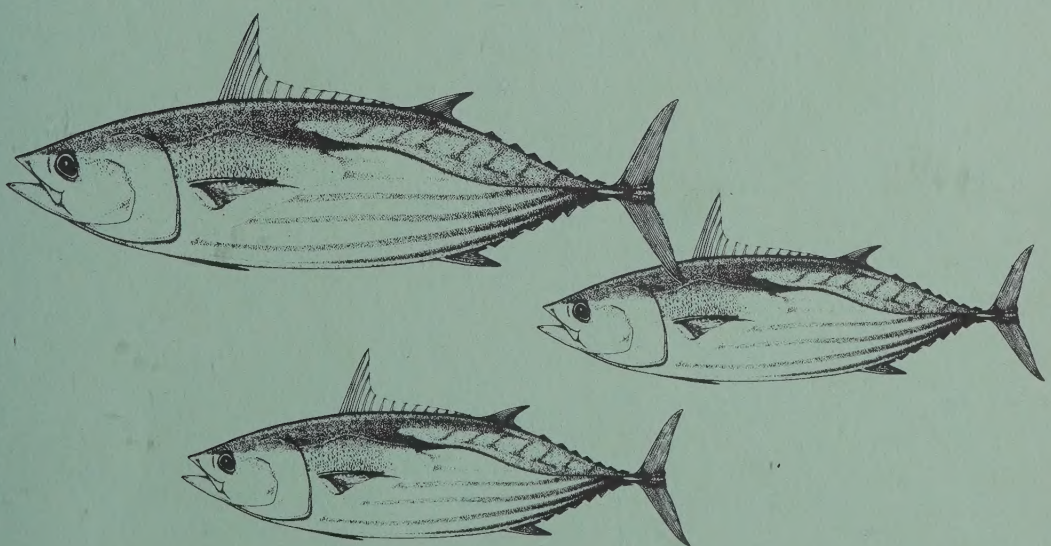
NOVEMBER 1977
No. 11

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL MARINE FISHERIES SERVICE

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE - P. O. BOX 271
LA JOLLA, CALIFORNIA 92037

FISHING INFORMATION

NOVEMBER 1977, No.11

EDITOR: JAMES A. RENNER

I. Barrett, Director, SOUTHWEST FISHERIES CENTER
R. Lasker, Acting Deputy Director
R. Shomura, Director, Honolulu Laboratory
N. Abramson, Director, Tiburon Laboratory
G. Seckel, Chief, Pacific Environmental Group, Monterey

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. It contains a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

Submitted for publication - December 23, 1977

CONTENTS

		Page
Acknowledgements		iv
Sea Surface Temperature and Environmental Conditions - November 1977, Forrest R. Miller		1
ENVIRONMENTAL CHARTS, PACIFIC OCEAN - November 1977		
Figure 1.	Seventeen-year mean (1961-1977) observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average winds speed (knots) regardless of direction.	4
Figure 2.	Observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction.	5
Figure 3.	Mean sea surface temperature, eastern North Pacific Ocean. Square shows temperatures at weathership station. Numerals on shore are temperatures at coastal and lightship stations.	6
Figure 4.	Mean sea surface temperature chart, western North Pacific Ocean.	7
Figure 5.	Deviation of sea surface temperatures, eastern North Pacific Ocean from 20-year mean (1948-67). Hatched areas are colder in 1977.	8
Figure 6.	Deviation of sea surface temperatures, western North Pacific Ocean from 20-year mean (1948-67). Hatched areas are colder in 1977.	9
Figure 7.	Deviation of sea surface temperatures, eastern North Pacific Ocean from those of November 1976. Hatched areas are colder in 1977.	10
Figure 8.	Mean sea surface temperatures, eastern tropical Pacific Ocean.	11
Figure 9.	Deviation of sea surface temperatures, eastern tropical Pacific Ocean from 20-year mean (1948-67). Shaded areas are colder in 1977. Contours are dashed in sparse data areas.	12
Figure 10.	Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between San Francisco and Honolulu November 18-25, 1977.	13

ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, and 15 day Supplement)

TECHNICAL EDITOR:
R. Allen
CARTOGRAPHY:
R. Allen, H. Orr

Acknowledgements

The following organizations and stations contributed data for November 1977 charts:

Inter-American Tropical Tuna Commission, La Jolla, California
Kelco Company, San Diego, California
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, La Jolla, California; Honolulu, Hawaii
National Weather Service, San Diego, California and Washington D.C.
National Ocean Survey, Pacific Marine Center, Seattle, Washington

Fisheries Research Board of Canada, Pacific Environment Institute, West Vancouver, British Columbia by L.F. Giovando from observations by:
J. Redhead at Langara Island Light; D.S. Robinson at Cape St. James Light;
L. Collins at Kains Island Light; E.M. Chapman and M.V. Stewart at Amphitrite Point Light

Scripps Institution of Oceanography, La Jolla, California

Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Hawaiian Queen* of the Matson Navigation Co. The data are processed under supervision of D.R. McLain at the NMFS Pacific Environmental Group, Monterey, California, using computer facilities of the Fleet Numerical Weather Central, Monterey. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Sea Surface Temperature and Environmental Conditions

Forrest R. Miller

Eastern North Pacific

During November sea surface temperatures (SST) normally show seasonal cooling over the north Pacific as high winds and rough seas mix the ocean surface layers. As a result, intensification of the north Pacific Ocean front occurs along the periphery of the Aleutian low which is normally centered in the Gulf of Alaska (Figure 1). The subtropical high pressure system usually moves southward in November with its center located near 30°N, 140°W. Between the Aleutian low and the subtropical high, surface winds and ocean mixing is usually intense. Along the southern boundary of the north Pacific Ocean front, which lies between 35°N and 45°N, developing weather systems intensify and move eastward over the northwestern U.S. and Canada.

During November 1977 the average location of the Aleutian low center was near its normal position (Figures 1 and 2). Central pressures in the low was about 2 millibars below normal. The eastern Pacific high pressure center was about 300 miles east of its normal position, and a weak pressure ridge extended eastward from the high pressure center over California (Figure 2). An elongated band of negative SST departures greater than 1°C stretched from the central Pacific at 30°N to the U.S. west coast (Figure 5). This region of colder than normal SST's coincided with a strong pressure gradient and above normal surface winds from 35°N to 50°N between the Aleutian low and the subtropical high pressure centers (Figure 2). Frequent storm development with extensive cloud cover, rough seas and high winds caused SST's to remain significantly below normal along the path of the weather systems, which brought heavy rains and snow to the Pacific northwest region. Along the entire U.S. west coast SST's were 1 to 2°C colder than November 1976 (Figure 7). This marked a significant departure in the SST pattern this November as compared to one year ago. In November 1976 SST's along the west coasts of the U.S. and Canada were above normal, and remained above normal throughout the winter.

The relatively warm ocean over the eastern Pacific during the winter of 1976-77 may have contributed to the drought conditions in the western U.S. and British Columbia. This condition ended north of 40°N in November 1977 when several Pacific storms dropped heavy amounts of precipitation over Washington and Oregon. High winds and rough seas associated with passing storm fronts mixed the surface layers off the coast of Washington, resulting in negative SST departures greater than 1°C and nearly 2°C below those of a year ago (Figure 7). From 35°N to 45°N and west of 160°W SST's were warmer than in November 1976 when a very deep Aleutian low was centered over the Aleutian Islands. Most of the eastern Pacific between 120°W and 170°W from 35°N to 20°N had near normal SST's, primarily because the subtropical high pressure system (Figure 2) remained near its normal position with very little departure in the normal surface wind circulation.

Based on the October and November 1977 SST departure from normal patterns, there appears to be no indication that the warm SST and drought conditions of the 1976-77 winter will return for any significant periods during the winter of 1977-78.

Western North Pacific

During November the western Pacific and the east coast of Japan were under the influence of a subtropical high pressure system centered near 35°N, 165°E. Above normal SST's occurred during the past two months east of Japan from 35°N to 43°N where lighter than normal southerly winds prevailed (Figure 6). In this area, the north Pacific Ocean front probably intensified between 38°N and 43°N (Figure 4) by the northward moving Japanese (Kuroshio) current. East of 170°E from 39°N to 45°N negative SST departures greater than 1°C were associated with strong northwest winds and rough seas which caused mixing of the surface layers along the north Pacific Ocean front. In this area, a strong surface pressure gradient persisted most of the month between the

Aleutian low and the western subtropical high pressure center. The negative SST departures greater than 1°C east of 170°E and centered around 30°N developed in November as a result of ocean mixing from increased easterly winds between an above normal subtropical high pressure center and the tropical low pressure trough.

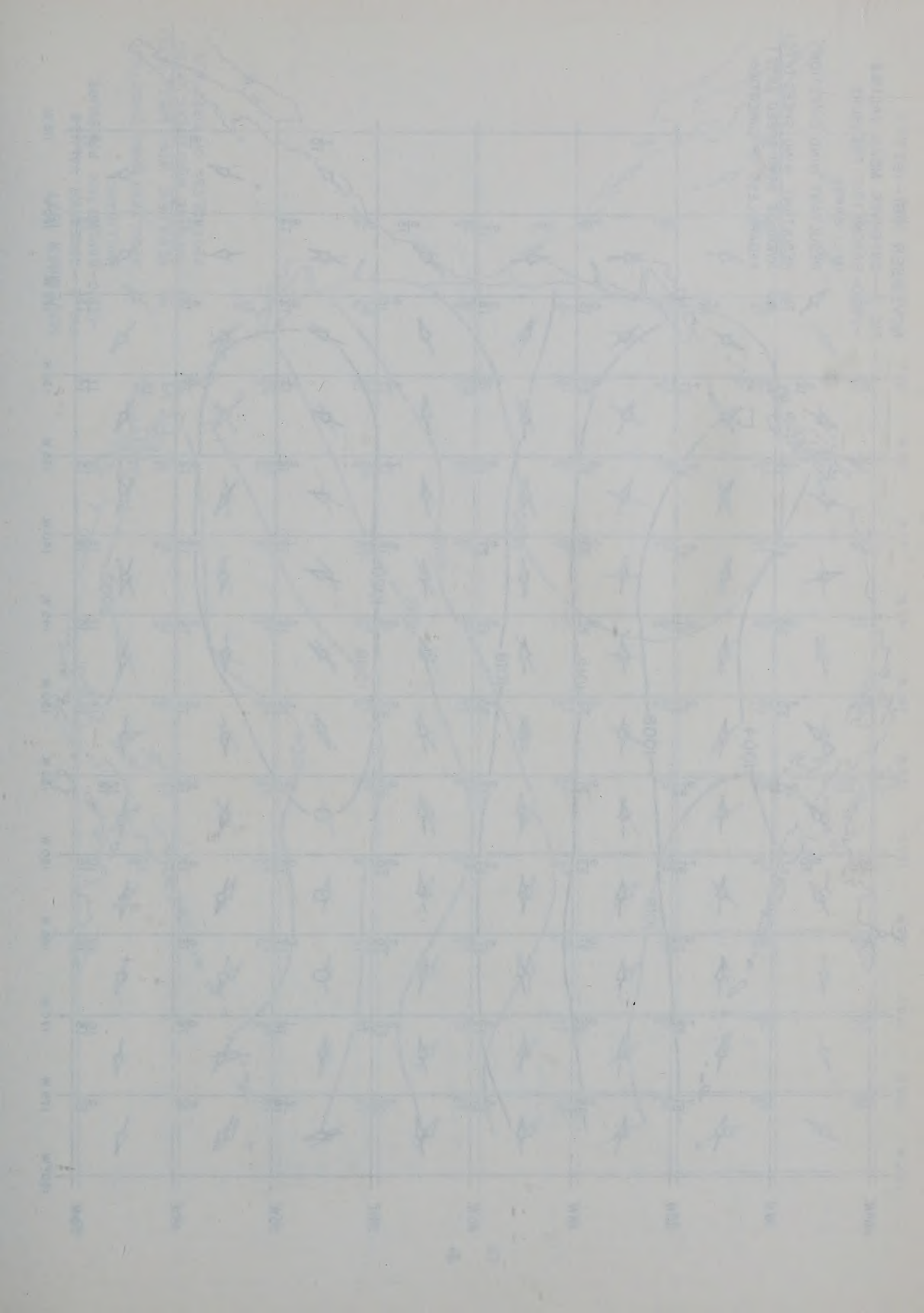
Eastern Tropical Pacific

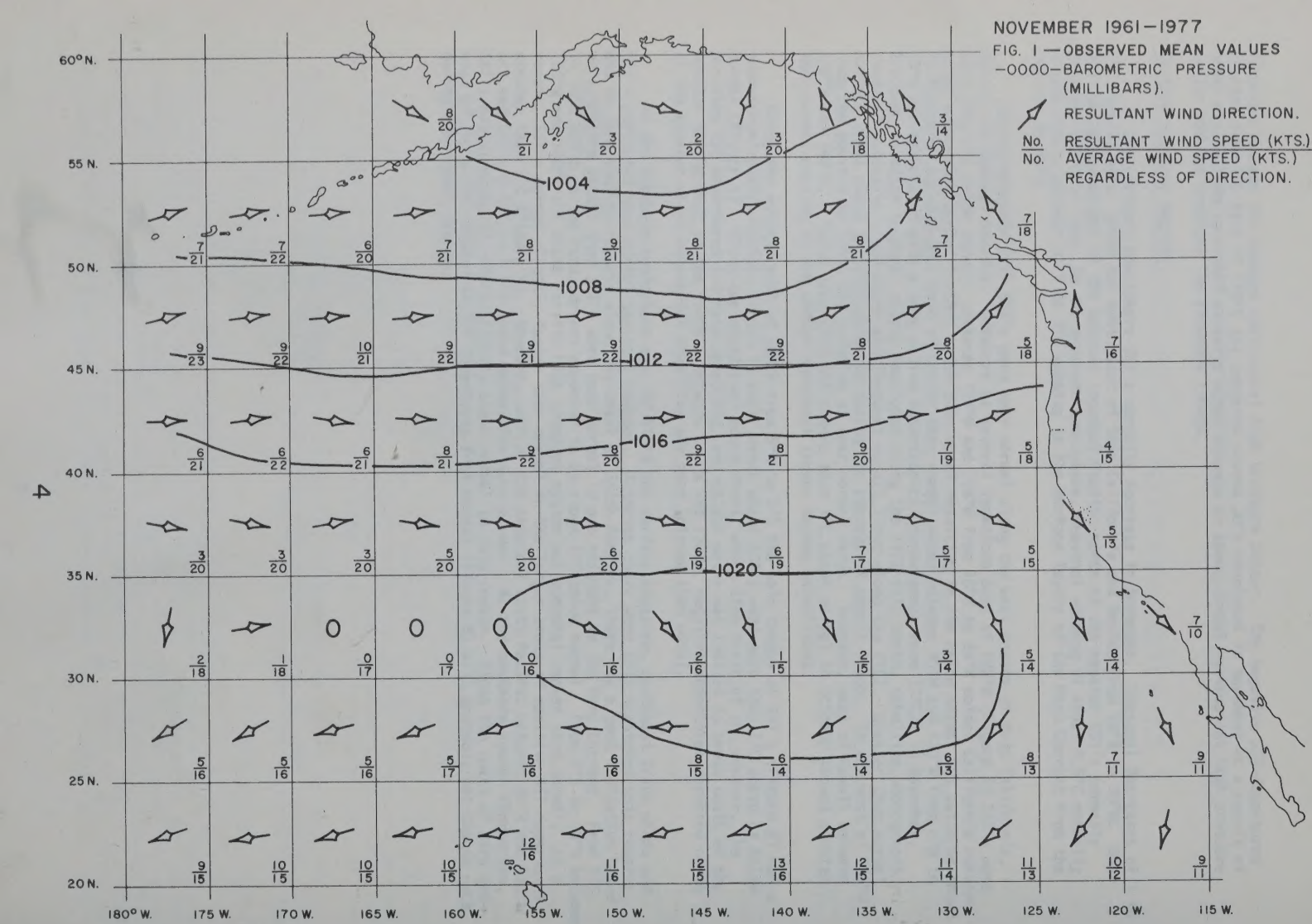
In the northern hemisphere SST's normally decrease in November. Seasonal decreases of 1 to 2°C usually occur along the west coast of Baja California and Mexico from 10°N to 30°N. Over most of the remainder of the eastern tropical Pacific north of the equator SST's normally decrease 0.5°C or less. In the southern hemisphere, seasonal warming of about 0.5°C normally occurs with a maximum of 1 to 2°C warming in the surface layers of the Peru Current from the equator to 25°S.

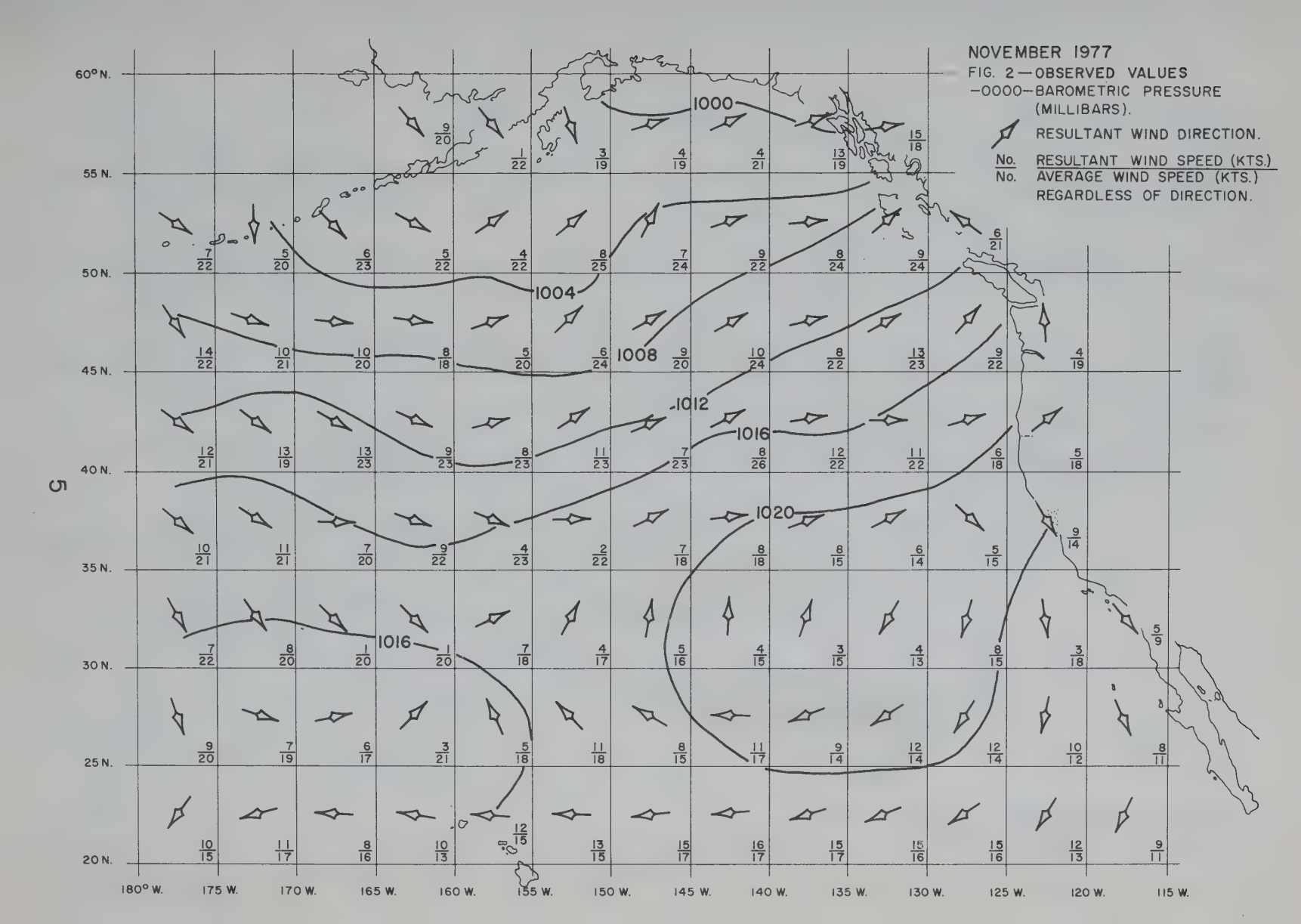
During November 1977 SST's were near normal along the west coasts of Baja California, Mexico and Central America. Offshore at several locations east of 120°W (Figure 9) SST's were more than 1°C below normal. Between 110°W and 125°W from 18°N to 24°N colder California current water apparently pushed farther south than usual resulting in the below normal SST patterns shown in Figure 9. An east-west band of cooler than normal water between 90°W and 130°W from 8°N to 15°N was associated with a very active intertropical convergence zone (ITCZ) in November. Although no major tropical storms developed along the ITCZ this month, satellite photographs revealed extensive cloud cover and frequent squall lines along the ITCZ. Greater than normal surface winds along the ITCZ occurred during the passage of squall lines. To the west of 130°W from the equator to 20°N, SST's cooled at near normal rates. However, east of Hawaii between 130°W and 140°W, a large area with SST's more than 1°C above normal in October showed greater than normal cooling as the winter northeast trades became established.

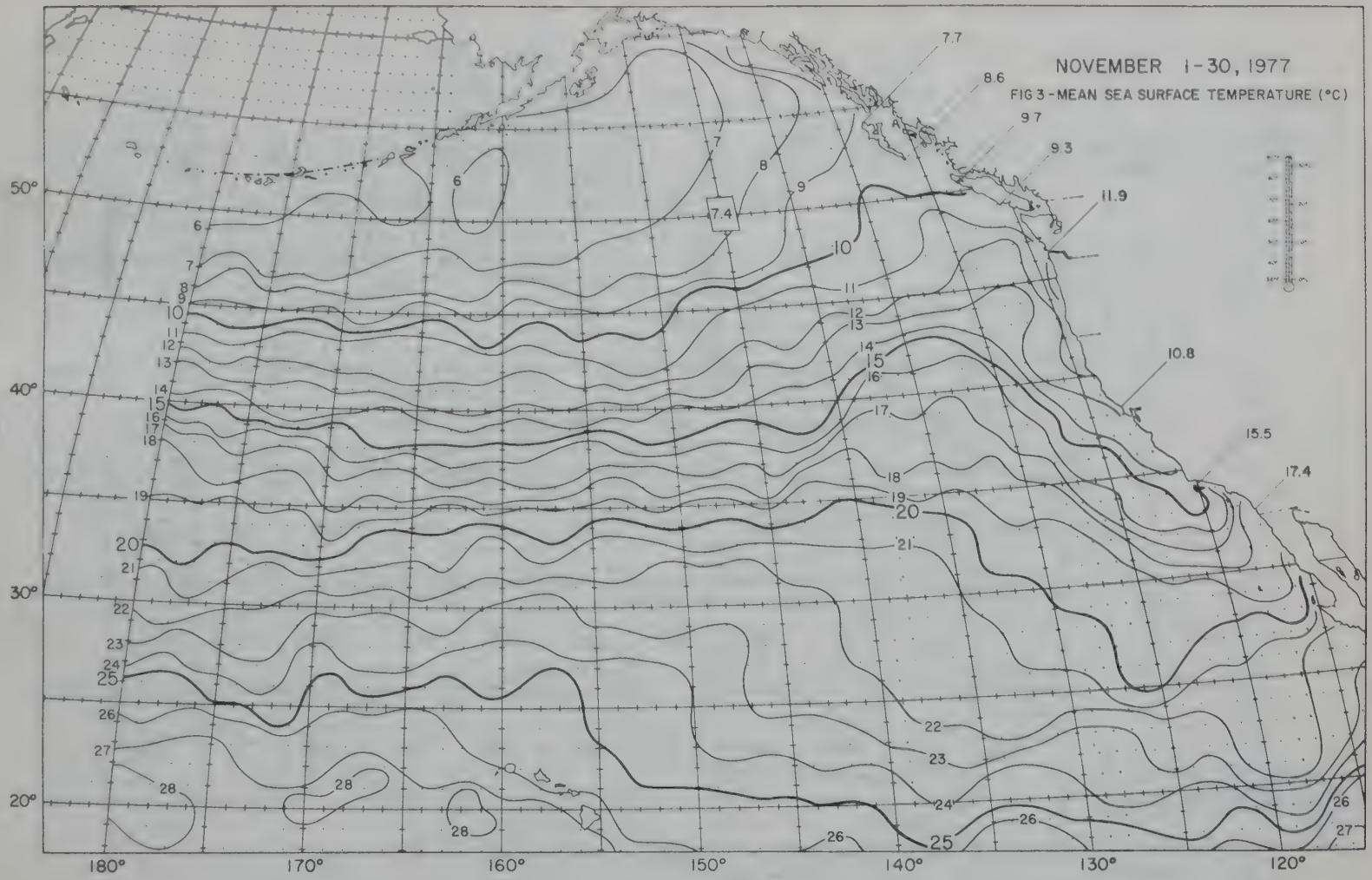
Along the equator east of 120°W from 5°N to 5°S the cold tongue of SST's (Figure 8) had a near-normal configuration, except in small areas where SST's were more than 1°C above or below normal (Figure 9). Along the equatorial ocean front, which lies north of the equator, the positive SST departures indicate upwelling, and colder water was limited to areas south of the equator during most of the month. Between 110°W and 120°W, negative departures occurred north of the equator where equatorial upwelling was more intense than usual.

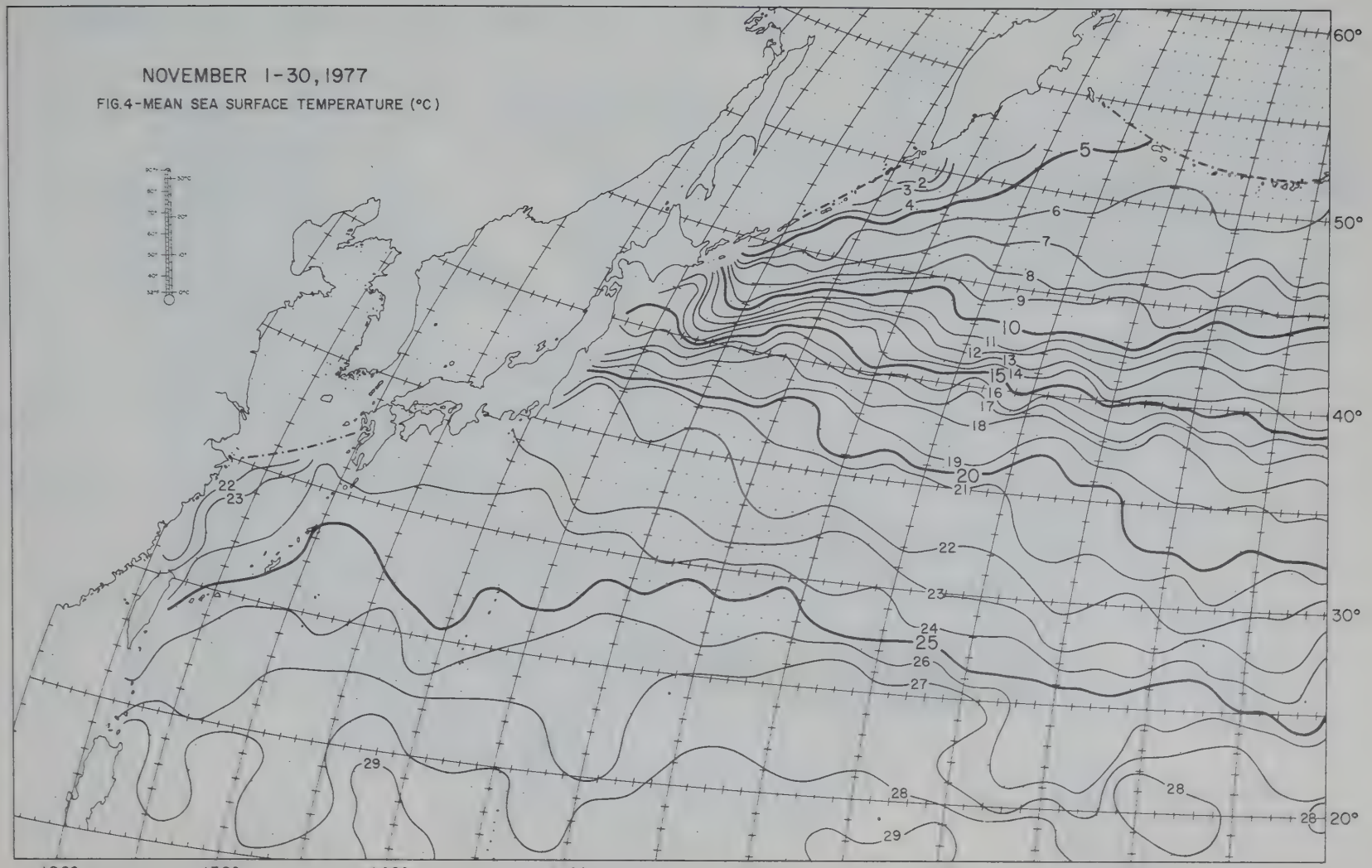
In the southern hemisphere east of 110°W the surface pressure, southeast trade winds and SST's reflected near normal seasonal changes. Although there were only scattered ship reports and no land station reports along the coast of South America, there was a good indication based on satellite photos that SST's were near normal in and adjacent to the Peru Current. From 5°S to 10°S SST's in the Peru Current appeared to be about 1°C below normal. From 5°S to 20°S between 110°W and 140°W the south Pacific high pressure system was somewhat weaker than normal. As a result, SST's warmed slightly faster than normal in the larger areas of positive SST departures greater than 1°C (Figure 9). However, much of the tropical south Pacific between 90°W and 150°W has had SST's 0.5°C to 1.5°C above normal for over a year. As the southern summer approaches, SST's are expected to remain slightly above normal in this region. Along the coast of Peru and west of 150°W the patterns of SST departures from normal (Figure 9) will probably not change much during the summer season.

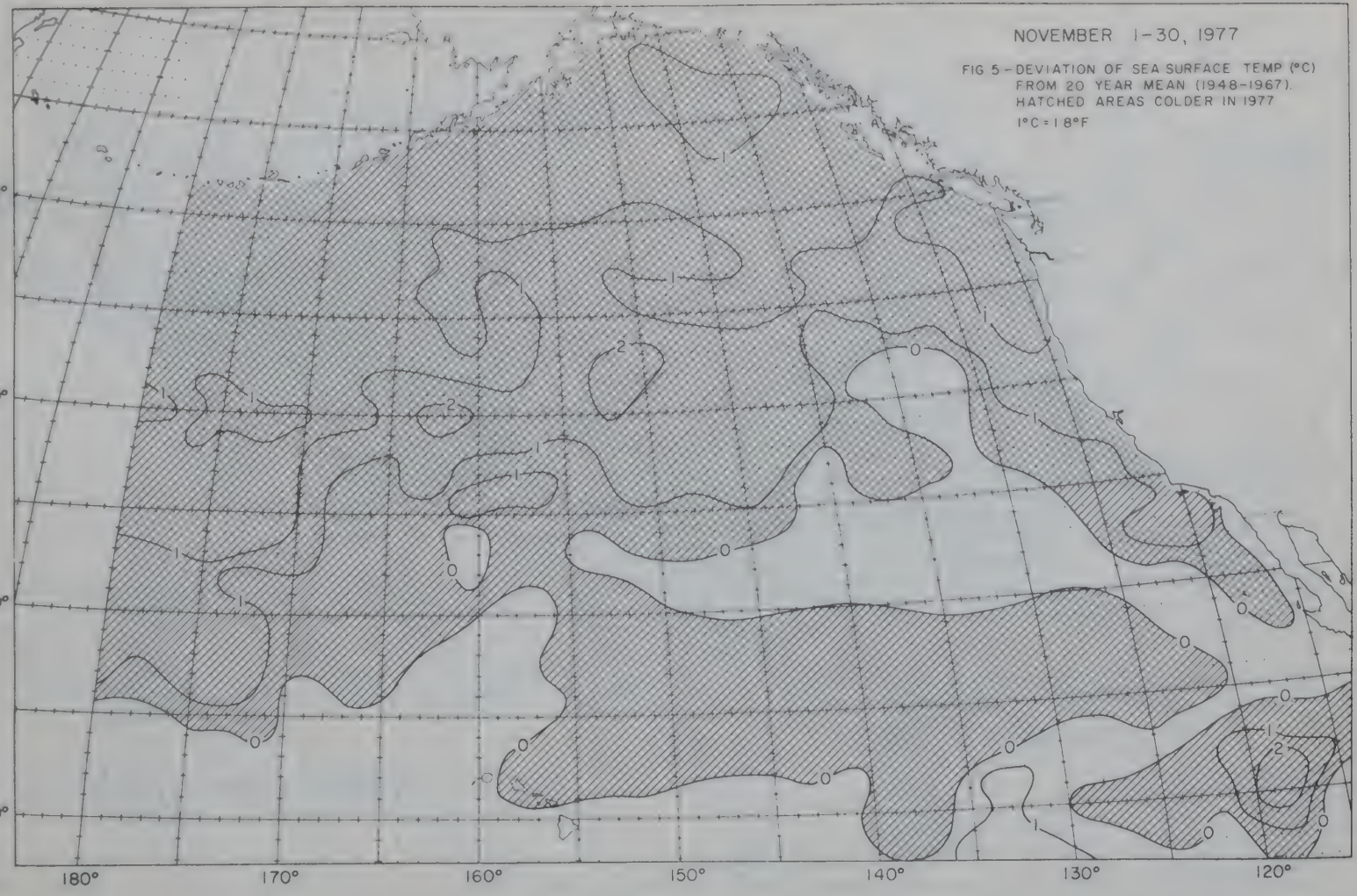


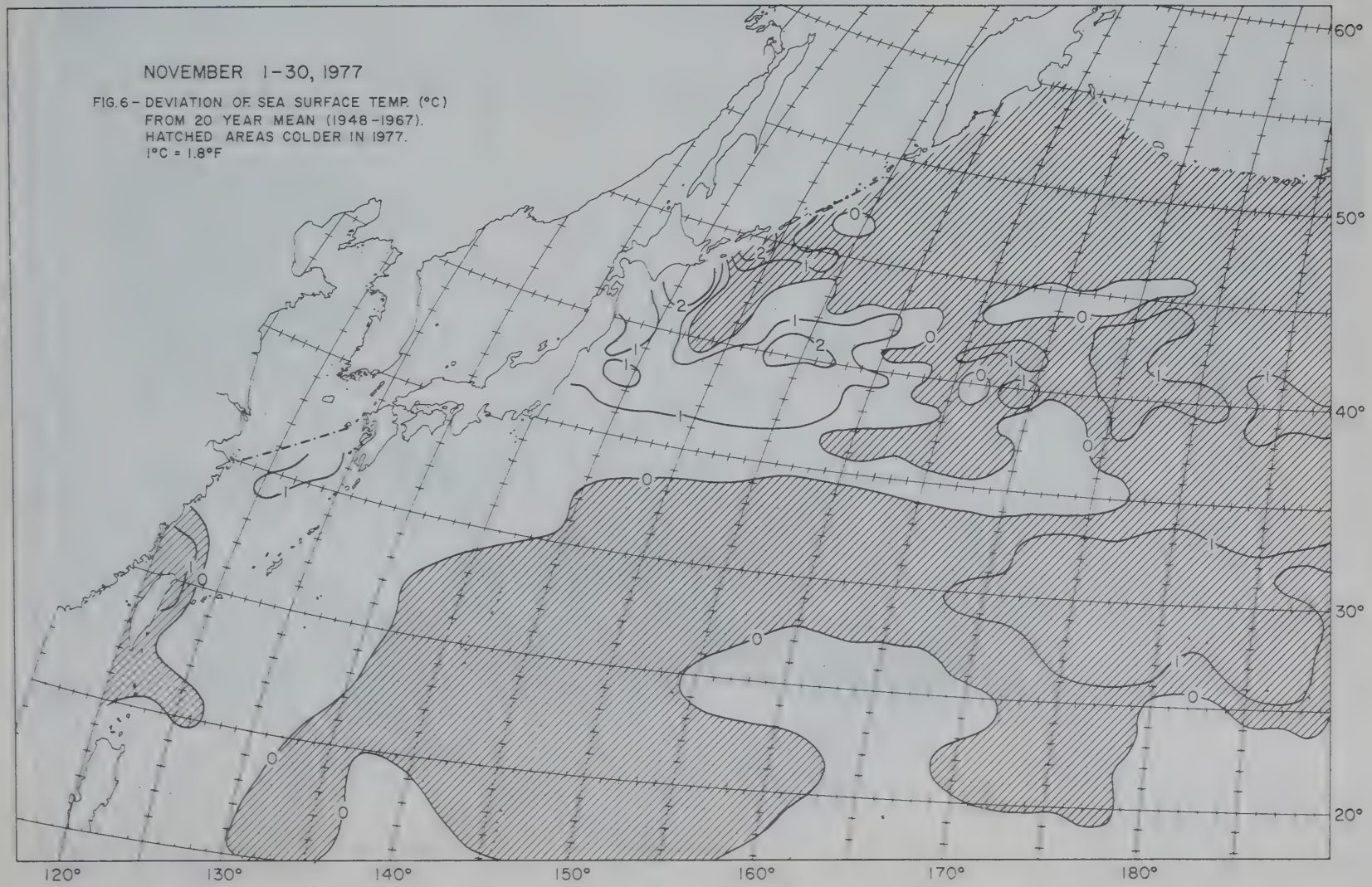

NOVEMBER 1961–1977
FIG. 1 — OBSERVED MEAN VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

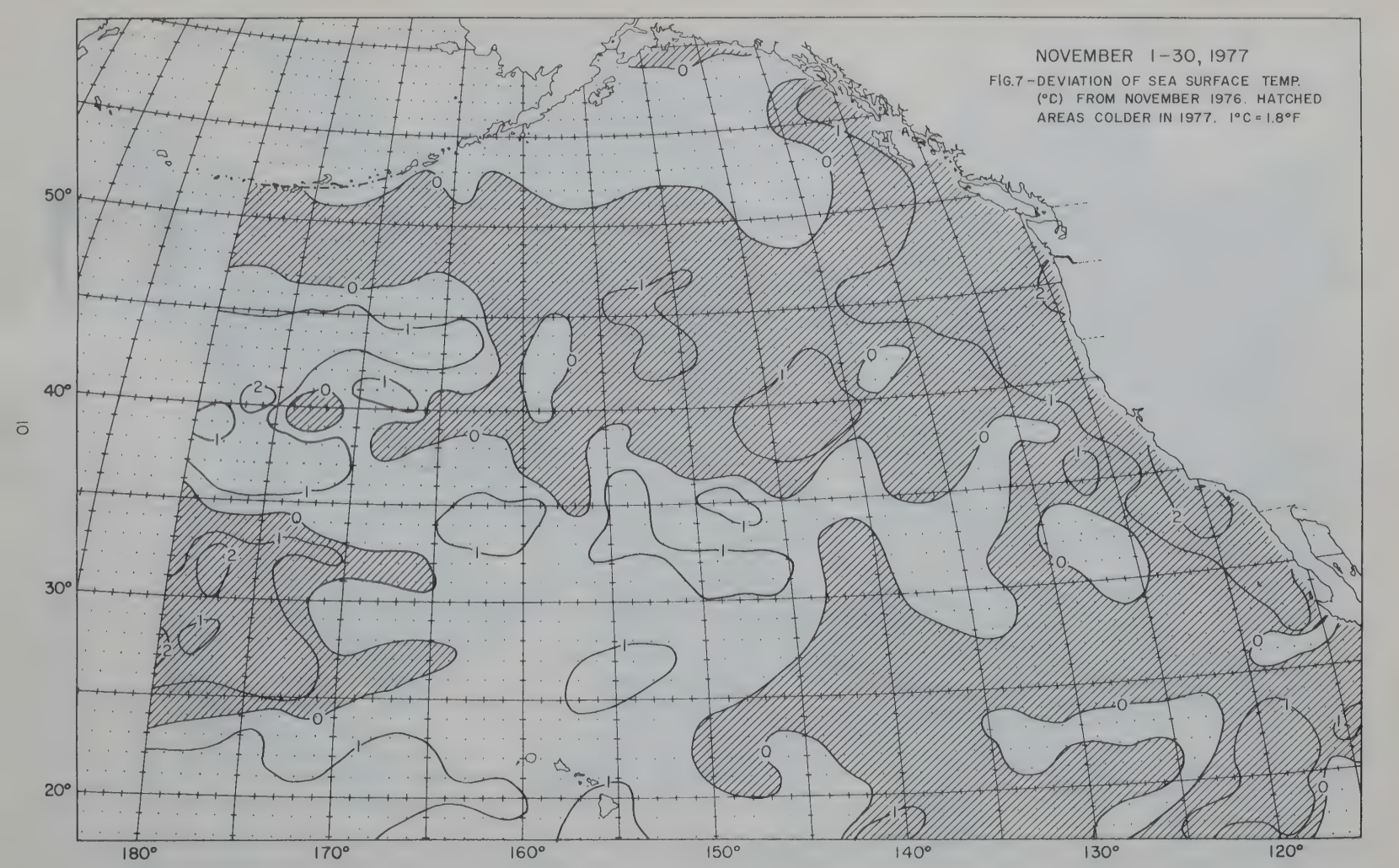

NOVEMBER 1977
FIG. 2—OBSERVED VALUES
-0000-BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1000
1004
1008
1012
1016
1020
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

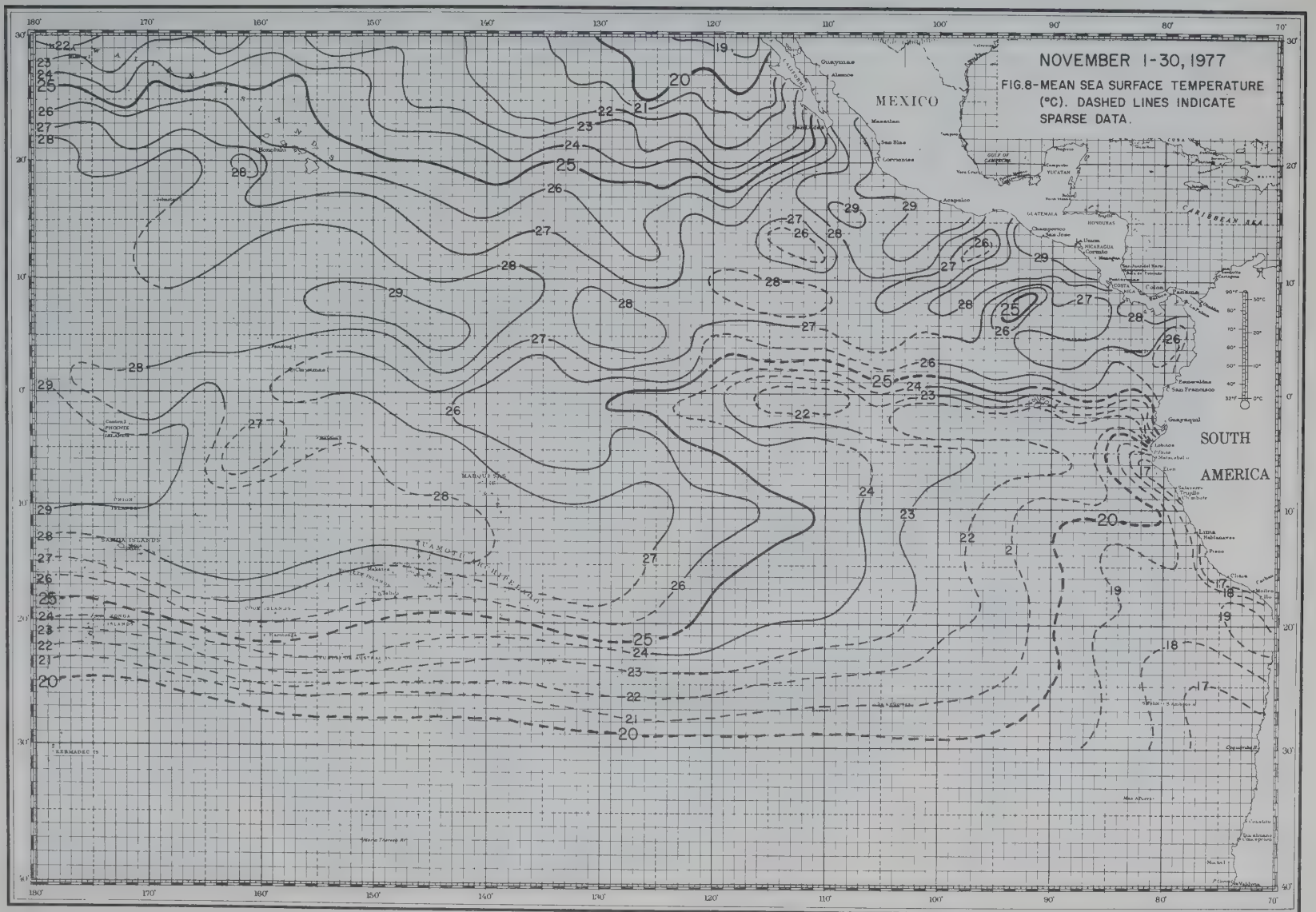

NOVEMBER 1-30, 1977
FIG 3 - MEAN SEA SURFACE TEMPERATURE (°C)
7.7
8.6
9.7
9.3
11.9
10.8
15.5
17.4
7.4
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1977
FIG.4-MEAN SEA SURFACE TEMPERATURE (°C)
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


NOVEMBER 1-30, 1977
FIG 5 - DEVIATION OF SEA SURFACE TEMP (°C) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1977
1°C = 1.8°F
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1977
FIG.6 - DEVIATION OF SEA SURFACE TEMP. (°C) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1977. 1°C = 1.8°F
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


NOVEMBER 1-30, 1977
FIG.7-DEVIATION OF SEA SURFACE TEMP. (°C) FROM NOVEMBER 1976. HATCHED AREAS COLDER IN 1977. 1°C = 1.8°F
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


NOVEMBER 1-30, 1977
FIG.8-MEAN SEA SURFACE TEMPERATURE (°C). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
CUBA
YUCATAN
GULF OF MEXICO
Acapulco
Guayaquil
Lima
Callao
San Francisco
Honolulu
Johnston
Christmas
Canton I.
PHOENIX ISLANDS
SAMOA ISLANDS
TUAMOTU ARCHIPELAGO
COOK ISLANDS
MARQUESAS
PENRHYN
TUBUAI ISLANDS
AUSTRAL
BERMADEC IS
Easter I.
Salas y Gomez
Juan Fernandez Arch.
Marie Therese Arch.
Mas Afuera
Mas a Tierra
Robinson Crusoe I.
Alexander Selkirk I.
Pascua
Valparaiso
Concepcion
Arauco
Corral
Talcahuano
Coronel
Lebu
Mocha I.
Valdivia
Corcovado
Guayaquil
Salaverry
Pisco
Chimbote
Callao
Lima
Huacho
Ancon
Paita
Talara
Tumbes
Puerto Pizarro
Manzanillo
Champerico
San Jose
Corinto
Masatlan
San Blas
Guaymas
Alamos
Ensenada
Cristobal
Balboa
Panama
Puntarenas
Limon
Colon
Puerto Cortes
Belize
Campeche
Progreso
Veracruz
Tampico
Havana
Nassau
Bermuda

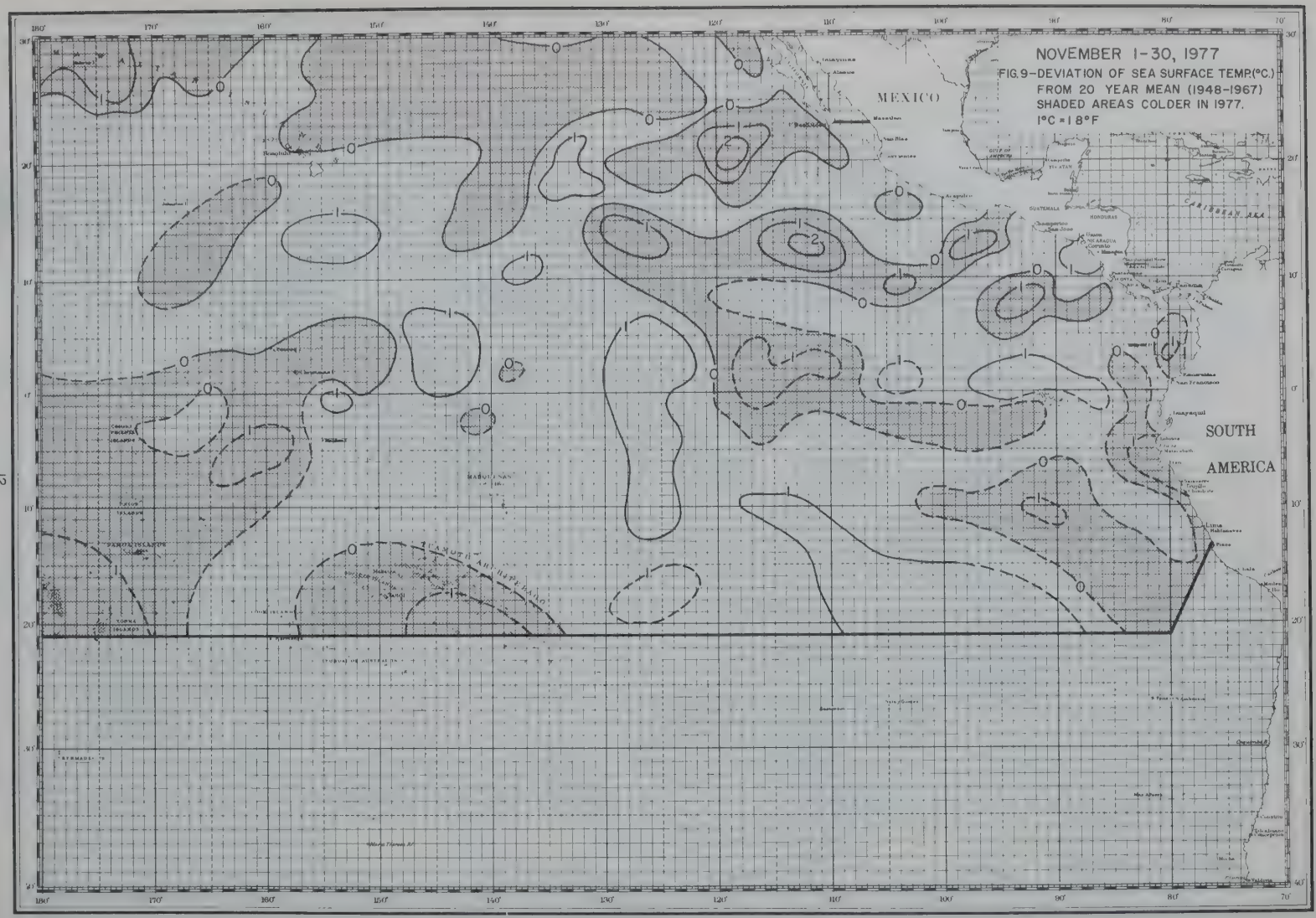
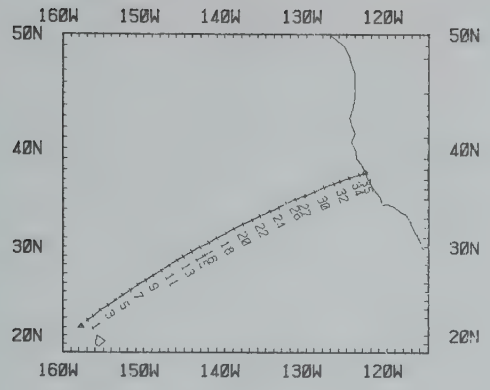
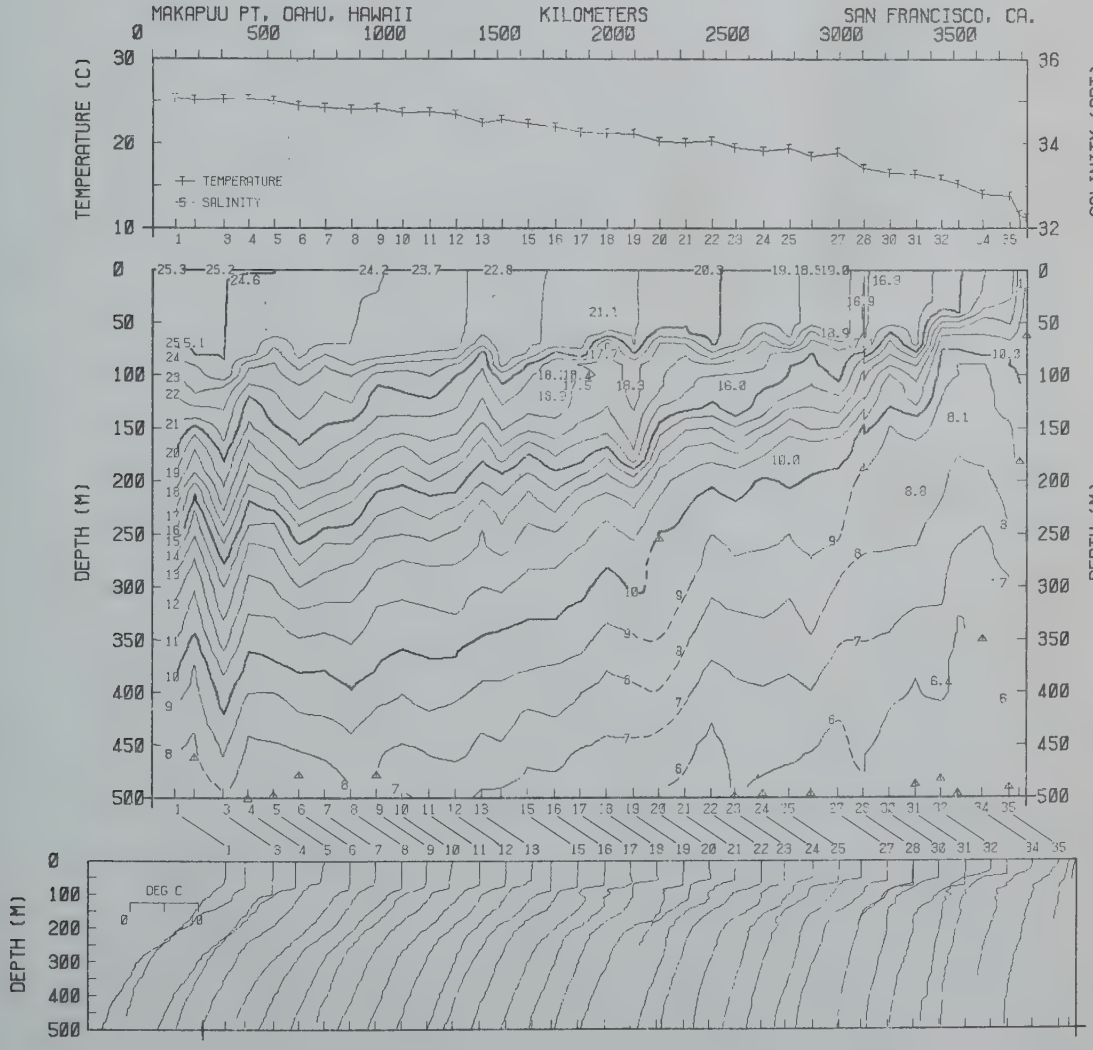

NOVEMBER 1-30, 1977
FIG.9-DEVIATION OF SEA SURFACE TEMP.(°C.)
FROM 20 YEAR MEAN (1948-1967)
SHADED AREAS COLDER IN 1977.
1°C = 1.8°F
MEXICO
SOUTH
AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°
40°
50°

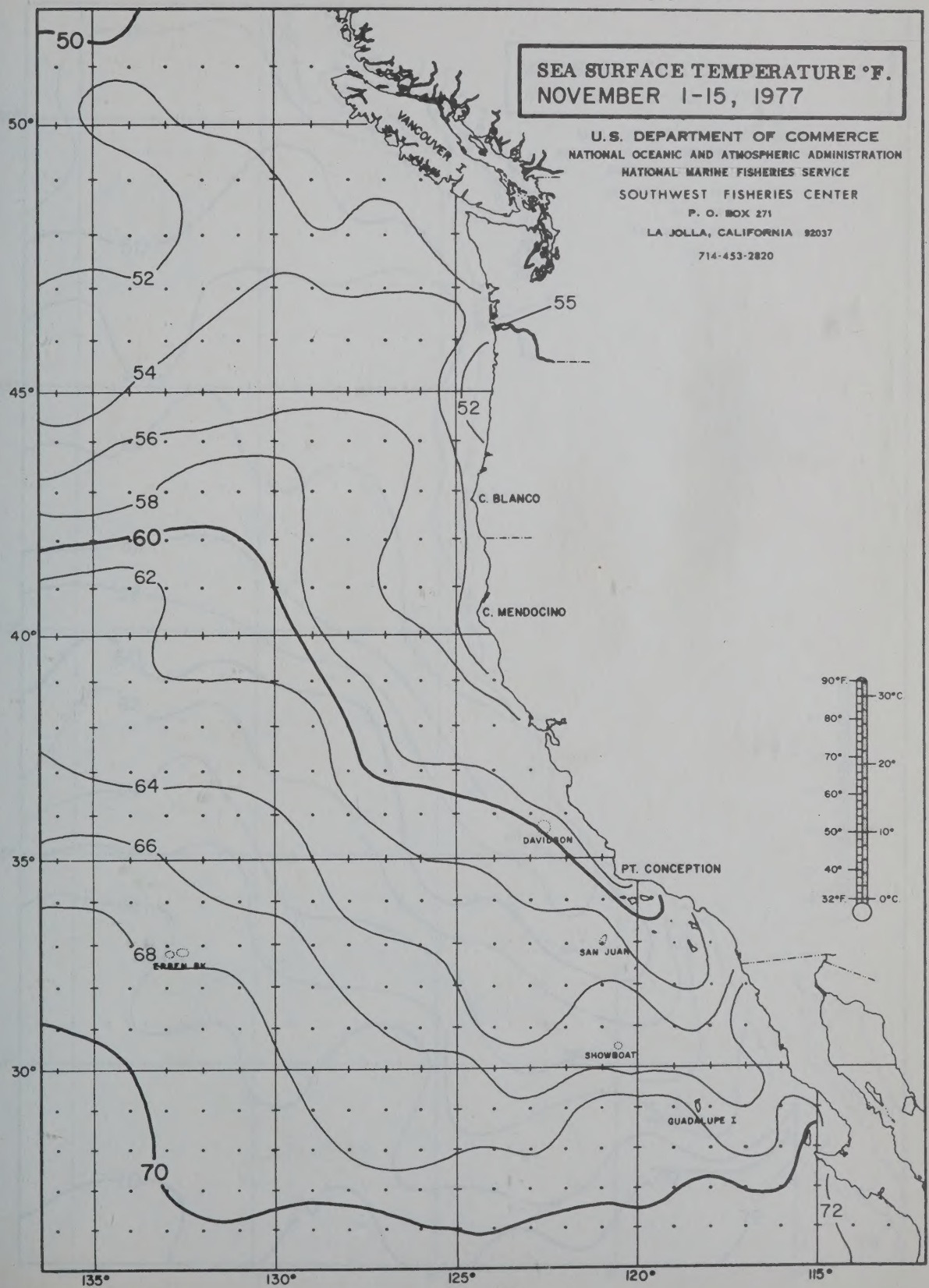
FIGURE 10

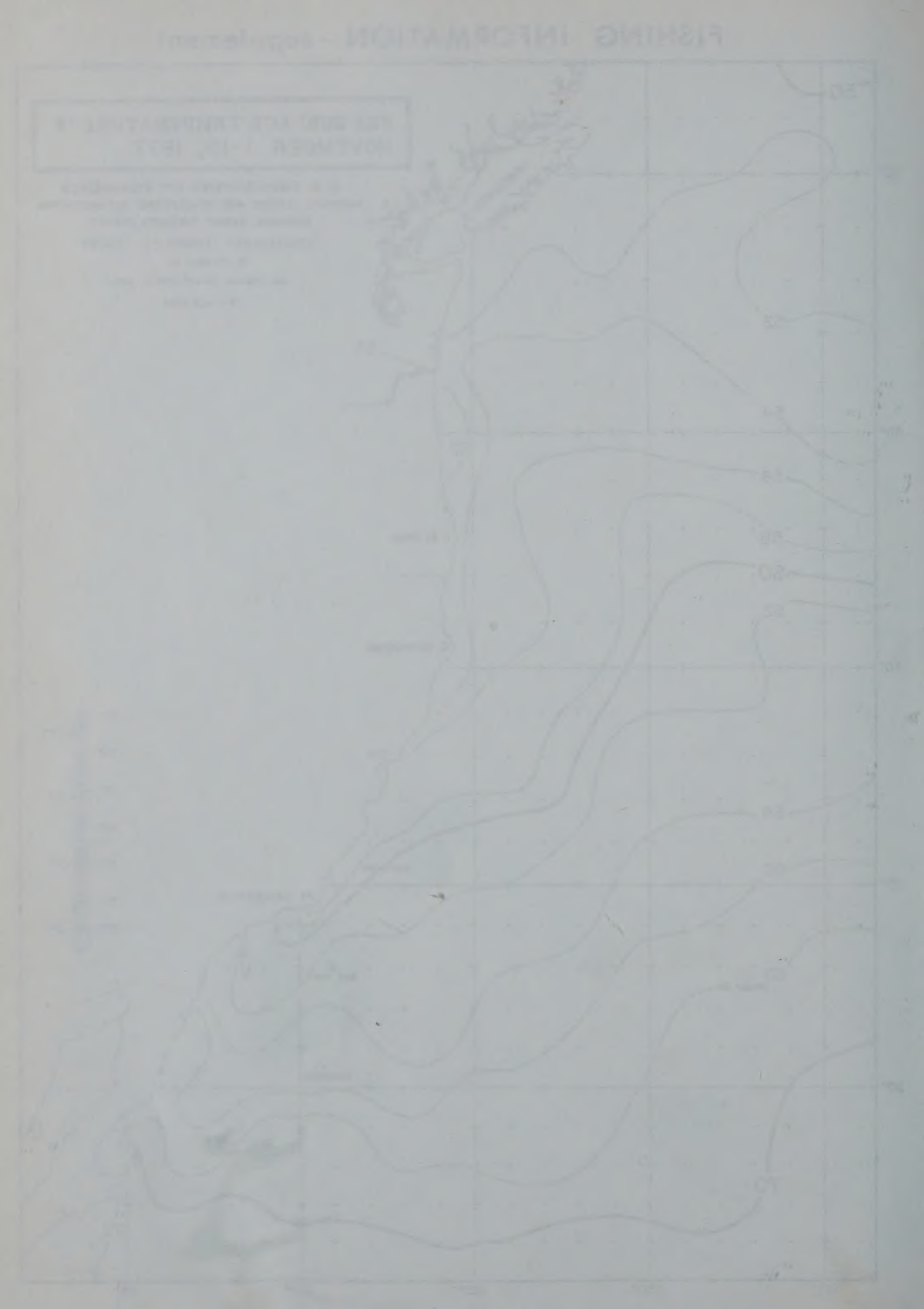


SHIP HAWAIIAN QUEEN
VOYAGE 214
MATSON
MAKAPUU PT, OAHU, HAWAII
- SAN FRANCISCO, CA.
18 NOV 1977 - 25 NOV 1977
NOAA-NMFS PEG MONTEREY, CA.



FISHING INFORMATION – supplement





FISHING INFORMATION – supplement